Safety Data Sheet

SECTION 1. Identification of the substance/mixture and of the company/undertaking.

1.1. Product identifier.

Product name. **PERMACOL 16.2**

1.2. Relevant identified uses of the substance or mixture and uses advised against.

Description/ Intended use **Concentrated insecticide in aqueous micro-emulsion, solvent-free with killing and residual action. Based on permethrin and tetramethrin, synergist with PBO. For domestic and civil use.**

1.3. Details of the supplier of the safety data sheet.

Name. **COLKIM S.r.l.**
Full address. **Via Piemonte, 50**
District and Country. **40064 OZZANO EMILIA (BO)**
Italia

Tel. 051 / 799445

Fax. 051 / 797555

E-mail address of the competent person, Responsible for the Safety Data Sheet. **info@colkim.it**

Product distribution by: **COLKIM S.r.l. - Via Piemonte, 50 - 40064 OZZANO E. (BO)**

1.4. Emergency telephone number.

For urgent inquiries refer to. **118**

Contact a poison control center:

Poison Control Center	Address	Telephone Number
CAV “Osp. Pediatrico Bambino Gesù”	P.zza Sant’Onofrio, 4 – 00165 Roma (RM)	06 68593726
Az. Osp. Univ. Foggia	V.le Luigi Pinto, 1 – 71122 Foggia (FG)	0881 732326
Az. Osp. "A. Cardarelli"	Via A. Cardarelli, 9 – 80131 Napoli (NA)	081 7472870
CAV Policlinico “Umberto I”	V.le del Policlinico, 155 – 00161 Roma (RM)	06 49978000
CAV Policlinico "A. Gemelli"	Largo Agostino Gemelli, 8 – 00168 Roma (RM)	06 3054343
Az. Osp. "Careggi" U.O. Tossicologia Medica	Largo Brambilla, 3 – 50134 Firenze (FI)	055 7947819
CAV Centro Nazionale di Informazione Tossicologica	Via Salvatore Maugeri, 10 – 27100 Pavia (PV)	0382 24444
Osp. Niguarda Ca' Granda	P.zza Ospedale Maggiore, 3 – 20162 Milano (MI)	02 66101029
Azienda Ospedaliera Papa Giovanni XXII	P.zza OMS, 1 – 24127 Bergamo (BG)	800883300
CAV centro antiveleni Verona	Verona	Piazzale Aristide Stefani,1

SECTION 2. Hazards identification.

2.1. Classification of the substance or mixture.

The product is classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of EC Regulation 1907/2006 and subsequent amendments. Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Skin Sensitization, category 1	H317	May cause an allergic skin reaction.
Carcinogenicity, category 2	H351	Suspected of causing cancer
Hazardous to the aquatic environment, chronic toxicity, category 1	H410	Very toxic to aquatic life with long lasting effects.

2.2. Label elements.

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:

Signal words: Warning

Hazard statements:

H319	May cause an allergic skin reaction.
H351	Suspected of causing cancer
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statements:

P201	Obtain special instructions before use.
P261	Avoid breathing mist/vapours/spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352	IF ON SKIN: Wash with plenty of soap and water
P308+P313	IF exposed or concerned: Get medical advice/attention
P321	Specific treatment (see advice on this label).
P405	Store locked up.
P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

2.3. Other hazards.

Inhalation and/or ingestion may produce health damage*.
Possible skin sensitizer*.
REACh - Art.57-59: The mixture does not contain Substances of Very High Concern (SVHC) at the SDS print date.

SECTION 3. Composition/information on ingredients.

3.1. Substances.

Refer to “composition of ingredients” in section 3.2

3.2. Mixtures.

Contains:

Identification.	**Conc.%**	**Classification 1272/2008 (CLP).**	**Nanoform Particle Characteristics**
TECHNICAL PERMETHRIN 25/75			
CAS. 52645-53-1 EC. 258-067-9 INDEX. 613-058-00-2 REACH. -	15	Acute Tox. 4 H302, Acute Tox. 4 H332, Skin Sens. 1 H317, Aquatic Acute 1 H400, Aquatic Chronic 1 H410	Not Available
PIPERONYL BUTOXIDE			
CAS. 51-03-6 EC. 200-076-7	10	Acute Tox. 4 H302, Acute Tox. 4 H312, Acute Tox. 4 H332, Aquatic Acute 1 H400, Aquatic Chronic 1 H410	Not Available

INDEX. 613-022-00-6 Reg. no. 01-219918969-16-0000, 01-2119918959-15-XXXX **TETRAMETRINA** CAS. 7696-12-0 CE. 231-711-6 INDEX. 613-022-00-6 REACH. -	2	Acute Tox. 4 H302, Acute Tox. 4 H312, Acute Tox. 4 H332, Aquatic Acute 1 H400, Aquatic Chronic 1 H410	Not Available

Legend: 1. Classified by Chemwatch; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 3. Classification drawn from C&L; * EU IOELVs available; [e] Substance identified as having endocrine disrupting properties

SECTION 4. First aid measures.

4.1. Description of first aid measures.

EYE CONTACT: If this product comes in contact with the eyes: Wash out immediately with fresh running water; Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids; Seek medical attention without delay; if pain persists or recurs seek medical attention; Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
SKIN CONTACT: If skin contact occurs: Immediately remove all contaminated clothing, including footwear; Flush skin and hair with running water (and soap if available); Seek medical attention in event of irritation.
INHALATION: If fumes, aerosols or combustion products are inhaled remove from contaminated area. Other measures are usually unnecessary.
INGESTION: If swallowed do NOT induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. Observe the patient carefully. Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. Seek medical advice.

4.2. Most important symptoms and effects, both acute and delayed.

For symptoms and effects caused by the contained substances, see chap. 11.

4.3. Indication of any immediate medical attention and special treatment needed.

For chronic or short term repeated exposures to pyrethrum and synthetic pyrethroids: Mammalian toxicity of pyrethrum and synthetic pyrethroids is low, in part because of poor bioavailability and a large first pass extraction by the liver; The most common adverse reaction results from the potent sensitising effects of pyrethrins; Clinical manifestations of exposure include contact dermatitis (erythema, vesiculation, bullae); anaphylactoid reactions (pallor, tachycardia, diaphoresis) and asthma [Ellenhorn Barceloux]; In cases of skin contact, it has been reported that topical application of Vitamin E Acetate (alpha-tocopherol acetate) has been found to have high therapeutic value, eliminating almost all skin pain associated with exposure to synthetic pyrethroids. [Incitec]

SECTION 5. Firefighting measures.

5.1. Extinguishing media.

SUITABLE EXTINGUISHING EQUIPMENT
foam extinguisher, dry chemical powder, BCF (where regulations permit), Carbon dioxide, Water spray or fog - Large fires only.

5.2. Special hazards arising from the substance or mixture.

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE
Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

5.3. Advice for firefighters.

FIRE FIGHTING
Alert Fire Brigade and tell them location and nature of hazard. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or water course. Use water delivered as a fine spray to control fire and cool adjacent area. Avoid spraying water onto liquid pools. DO NOT approach containers suspected to be hot. Cool fire exposed containers with water spray from a protected location. If safe to do so, remove containers from path of fire.

FIRE/EXPLOSION HAZARD
Combustible. Slight fire hazard when exposed to heat or flame. Heating may cause expansion or decomposition leading to violent rupture of containers.

On combustion, may emit toxic fumes of carbon monoxide (CO). May emit acrid smoke. Mists containing combustible materials may be explosive. Combustion products include: carbon dioxide (CO2), hydrogen chloride, phosgene and other pyrolysis products typical of burning organic material.

SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures.

Referred to Section 8.

6.2. Environmental precautions.

Referred to Section 12.

6.3. Methods and material for containment and cleaning up.

MINOR SPILLS
Environmental hazard - contain spillage. Clean up all spills immediately. Avoid breathing vapours and contact with skin and eyes. Control personal contact with the substance, by using protective equipment. Contain and absorb spill with sand, earth, inert material or vermiculite. Wipe up. Place in a suitable, labelled container for waste disposal.

MAJOR SPILLS
Environmental hazard - contain spillage. Moderate hazard. Clear area of personnel and move upwind. Alert Fire Brigade and tell them location and nature of hazard. Wear breathing apparatus plus protective gloves. Prevent, by any means available, spillage from entering drains or water course. No smoking, naked lights or ignition sources. Increase ventilation. Stop leak if safe to do so. Contain spill with sand, earth or vermiculite. Collect recoverable product into labelled containers for recycling. Absorb remaining product with sand, earth or vermiculite. Collect solid residues and seal in labelled drums for disposal. Wash area and prevent runoff into drains. If contamination of drains or waterways occurs, advise emergency services.

6.4. Reference to other sections.

Personal Protective Equipment advice is contained in Section 8 of the SDS..

SECTION 7. Handling and storage.

7.1. Precautions for safe handling.

SAFE HANDLING
Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps. DO NOT enter confined spaces until atmosphere has been checked. Avoid smoking, naked lights or ignition sources. Avoid contact with incompatible materials. When handling, DO NOT eat, drink or smoke. Keep containers securely sealed when not in use. Avoid physical damage to containers. Always wash hands with soap and water after handling. Work clothes should be laundered separately. Use good occupational work practice. Observe manufacturer's storage and handling recommendations contained within this SDS. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions. DO NOT allow clothing wet with material to stay in contact with skin

FIRE AND EXPLOSION PROTECTION
See section 5

OTHER INFORMATION
Store in original containers. Keep containers securely sealed. Other information Store in a cool, dry, well-ventilated area. Store away from incompatible materials and foodstuff containers. Protect containers against physical damage and check regularly for leaks. Observe manufacturer's storage and handling recommendations contained within this SDS.

7.2. Conditions for safe storage, including any incompatibilities.

SUITABLE CONTAINER
Metal can or drum. Packaging as recommended by manufacturer. Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY
Pyrethrins and permethrins: are unstable in the presence of light, heat, moisture and air; are hydrolysed by oxygen and/ or sunlight; may react with strong oxidisers to produce fire and explosions; are incompatible with alkalis; Avoid reaction with oxidising agents.

7.3. Specific end use(s).

Refer to section 1.2

SECTION 8. Exposure controls/personal protection.

8.1. Control parameters.

Ingredienti	DNELs Esempio di esposizione lavoratore	PNECs Comparato
Piperonyl butoxide	Dermal 0.443 mg/kg bw/day (Systemic, Chronic) Inhalation 1.6 mg/m³ (Systemic, Chronic) Dermal 0.44 mg/cm² (Local, Chronic) Inhalation 3.875 mg/m³ (Local, Chronic) Dermal 55.5 mg/kg bw/day (Systemic, Acute) Inhalation 7.75 mg/m³ (Systemic, Acute) Dermal 0.888 mg/cm² (Local, Acute) Inhalation 3.875 mg/m³ (Local, Acute) Dermal 0.221 mg/kg bw/day (Systemic, Chronic) * Inhalation 0.388 mg/m³ (Systemic, Chronic) * Oral 0.221 mg/kg bw/day (Systemic, Chronic) * Dermal 0.22 mg/cm² (Local, Chronic) * Inhalation 1.94 mg/m³ (Local, Chronic) * Dermal 27.8 mg/kg bw/day (Systemic, Acute) * Inhalation 3.875 mg/m³ (Systemic, Acute) * Oral 2.3 mg/kg bw/day (Systemic, Acute) * Dermal 0.22 mg/cm² (Local, Acute) * Inhalation 1.94 mg/m³ (Local, Acute) *	0.001 mg/L (Water (Fresh)) 0 mg/L (Water - Intermittent release) 0.043 mg/kg sediment dw (Sedimenti (Acqua dolce)) 0.004 mg/kg sediment dw (Sedimenti (Marini)) 0.032 mg/kg soil dw (Suolo) 0.2 mg/L (STP)

* Values for General Population

EMERGENCY LIMITS

Ingredient	TEEL-1	TEEL-2	TEEL-3
Piperonyl butoxide	6.5 mg/m^3	72.mg/m^3	1.200mg/m^3

Ingredient	Original IDLH	Revised IDLH
Permethrin	Not available	Not available
Piperonyl butoxide	Not available	Not available
Tetramethrin	Not available	Not available

OCCUPATIONAL EXPOSURE BANDING

Ingrediente	Occupational Exposure Band Rating	Occupational Exposure Band Limit
Permethrin	D	>0.01 to ≤ 0.1 mg/m^3
Tetramethrin	E	≤ 0.1 mg/m^3
Notes:	Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.	

MATERIAL DATA
For pyrethrum and its active components: IDLH Level: 5000 mg/m^3
Pyrethrum and/or its active components, the pyrethrins, cause dermatitis and sensitisation. Ingestion of massive doses can induce convulsions, vomiting and bradycardia. Animals exhibit liver damage and death through respiratory failure. The recommended TLV-TWA is equivalent to an occupational dose of 0.7 mg/kg/day and is thought to minimise the potential for systemic effects. The TLV may NOT prevent the development of hypersensitisation, particularly among those with pre-existing allergies to pollen and related agents.
Synthetic pyrethrins (pyrethroids) often produce a range of toxic effects resembling pyrethrum; in the absence of a regulated exposure limit prudence dictates that the value for pyrethrum serves as a reference.

8.2. Exposure controls.

8.2.1. APPROPRIATE ENGINEERING CONTROLS	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use. Employers may need to use multiple types of controls to prevent employee overexposure. General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear

SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air)	0.25-0.5 m/s
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	(50-100 f/min)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	0.5-1 m/s (100-200 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	1-2.5 m/s (200-500 f/min)

Within each range the appropriate value depends on::

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood - local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

8.2.2 PERSONAL PROTECTION	
Eye and face protection	Safety glasses with side shields. Chemical goggles. Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]
Skin protection	See Hand protection below
Hands/feet protection	Wear chemical protective gloves, e.g. PVC. Wear safety footwear or safety gumboots, e.g. Rubber NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact. Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed. The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended. Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: frequency and duration of contact, chemical

	resistance of glove material, glove thickness and dexterity. Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent). When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use. Contaminated gloves should be replaced. As defined in ASTM F-739-96 in any application, gloves are rated as: Excellent when breakthrough time > 480 min; Good when breakthrough time > 20 min; Fair when breakthrough time < 20 min and Poor when glove material degrades. For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended. It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times. Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task. Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example: Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.· Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Body protection	See Other protection below
Other protection	Overalls. P.V.C apron. Barrier cream. Skin cleansing cream. Eye wash unit.

RESPIRATORY PROTECTION
Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)
Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Required minimum protection factor	Maximum gas/vapour concentration present in air p.p.m. (by volume)	Half-face Respirator	Full-Face Respirator
Up to 10	1000	A-AUS / Class1	-
Up to 50	1000	-	A-AUS / Class 1
Up to 50	5000	Airline *	-
Up to 100	5000	-	A-2
Up to 100	10000	-	A-3
100+			Airline**

* - Continuous Flow ** - Continuous-flow or positive pressure demand
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)
Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used

8.2.3. Environmental exposure controls.
Referre to section 12

SECTION 9. Physical and chemical properties.

9.1. Information on basic physical and chemical properties.

Appearance	Liquid
Colour	Transparent Amber
Odour	Not available.
Odour threshold.	Not available.
pH.	6.5

Melting point / freezing point.	Not available.
Initial boiling point.	Not available.
Boiling range.	Not available.
Flash point.	>60 °C.
Evaporation Rate	Not available.
Flammability	Combustible
Lower explosive limit.	Not available.
Upper explosive limit.	Not available.
Vapour pressure.	Not available.
Solubility in water	Not available.
Vapour density	Not available.
Nanoform solubility	Not available.
Particle size	Not available.
Density.(Water =1)	1.07.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature.	Not available.
Decomposition temperature.	Not available.
Viscosity	70 cSt.
Molecular weight	Not available.
Taste	Not available.
Explosive properties	Not available.
Oxidising properties	Not available.
Surface tension	Not available.
Volatile component	Not available.
Gas group	Not available.
Ph as a soluion (1%)	Not available.
VOC	Not available.
Nanoform partiche charcteristic	Not available.

9.2. Other information.

Information not available.

SECTION 10. Stability and reactivity.

10.1. Reactivity.

Refer to section 7.2.

10.2. Chemical stability.

Unstable in the presence of incompatible materials. Product is considered stable. Hazardous polymerisation will not occur.

10.3. Possibility of hazardous reactions.

Refer to section 7.2.

10.4. Conditions to avoid.

Refer to section 7.2.

10.5. Incompatible materials.

Refer to section 7.2.

10.6. Hazardous decomposition products.

Refer to section 5.3

SECTION 11. Toxicological information.

No episodes of damage to health due to exposure to the product are known. In any case it is recommended to operate in compliance with the rules of good industrial hygiene. The preparation may, in particularly sensitive individuals, cause slight health effects due to inhalation and/or cutaneous absorption and/or contact with the eyes and / or ingestion.

11.1. Information on toxicological effects.

Inhaled	The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Inhalation of pyrethrins may produce nausea, vomiting, sneezing, serious nasal discharge, nasal stuffiness and asthma. High concentrations may produce hyperexcitability, incoordination, tremors, muscular paralysis and death (due to respiratory failure). There have been some reports of transient facial tingling (paraesthesia) which lasts a few hours after exposure. In common with natural pyrethrins, the material may produce central nervous system stimulation with nausea, vomiting, gastroenteritis, diarrhoea, hypersensitivity, incoordination, tremors, muscle paralysis, convulsion, coma, and respiratory failure. Synthetic pyrethroids are neuropoisons acting on the axons in the peripheral and central nervous systems by interacting with sodium channels in mammals and/or insects. A single dose produces toxic signs in mammals, such as tremors, hyperexcitability, salivation, choreoathetosis (a condition characterised by aimless muscle movements and involuntary motions), and paralysis. The signs disappear fairly rapidly, and the animals recover, generally within a week. At near-lethal dose levels, synthetic pyrethroids cause transient changes in the nervous system, such as axonal swelling and/or breaks and myelin degeneration in the sciatic nerves. They are not considered to cause delayed neurotoxicity of the kind induced by some organophosphorus compounds. Pyrethroids have at least two distinct actions- a short-term pharmacological effect at near-lethal dose levels and a more long-term neurotoxic effect that results in sparse axonal nerve damage. This synthetic pyrethroid produces Type I poisoning syndrome (or "T" syndrome which is characteristic of those esters lacking an alpha-cyano substituent) and, in rats, causes such signs as sparring and aggressive behaviour, enhanced startle response, whole body tremor and prostration. Evidence indicates that Type I syndrome involves peripheral nerves in the mammal. Although this insecticide cannot be considered highly toxic in mammals its use indoors, in enclosed and poorly ventilated spaces may result in toxic effects in humans. Although natural pyrethroid produces allergic responses (rather than direct neurotoxicity) there is little evidence of allergic-type responses amongst humans exposed to the synthetic pyrethroid esters. [Cassaret & Doull's Toxicology: The Basic Science of Poisoning, 4th Ed.]
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual. Piperidines produces a pressor effect (blood-pressure increase) and respiratory stimulation in a manner similar to their analogue, nicotine. The piperidine alkaloids (e.g. coniine), extracted from poison hemlock, produce ataxia, salivation, convulsions and coma. Because of structural similarities with nicotine, various mammalian receptors may bind these substances. As a consequence, clinical findings may include initial stimulation (tremor, ataxia, mydriasis), nausea, vomiting, sore throat followed by cardiorespiratory depression (bradycardia, paralysis, coma) and ascending paralysis. Death may result from respiratory failure. Stimulation of nicotinic receptors primarily affects the autonomic ganglia, adrenal medulla, and the motor end-plate of striated muscle; nicotinic agonists primarily produce actions affecting the neurosmuscular junctions (producing, for example, fasciculations, weakness and paralysis) and muscarinic effects (producing postganglionic stimulation and, as a result, cardiac inhibition, vasodilation, salivation, lachrymation, bronchoconstriction and gastrointestinal stimulation). In animals, near lethal doses of piperidine may produce increased excitability to sound and touch and cause contraction of the smooth muscle and increased blood pressure. The piperidines may exert an inotropic and chronotropic action on the heart. Large doses block ganglionic conduction. Small doses cause both parasympathetic and sympathetic stimulation due to action on the ganglia. Signs of intoxication include increased blood pressure and heart rate, nausea, vomiting, salivation, laboured breathing, muscular weakness, paralysis and convulsions. Ingestion of pyrethrins may produce nausea, vomiting, headache and other central nervous system disturbances. Excitation, muscular tremors and a period of shock may be followed by death. Dogs fed 5000 ppm of pyrethrum, for 90 days, developed dyspnae, tremors, ataxia and excessive salivation. An estimated fatal human dose is thought to be 100 gms. for a typical 70 kg man (1430 mg/kg).
Skin Contact	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting. Skin contact with natural pyrethrins may result in severe dermatitis and may also be associated with allergic rhinitis and asthma. Absorption through the skin may result in a toxic syndrome similar to that produced by inhalation. Systemic effects, following skin absorption, may include liver and kidney damage. Prolonged or repeated exposure may cause central nervous system effects and allergic skin reaction. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).
Chronic	On the basis, primarily, of animal experiments, concern has been expressed that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment. Practical experience shows that skin contact with the material is capable either of inducing a sensitisation reaction in a substantial number of individuals, and/or of producing a positive response in experimental animals.

Substances that can cause occupational asthma (also known as asthmagens and respiratory sensitisers) can induce a state of specific airway hyper-responsiveness via an immunological, irritant or other mechanism. Once the airways have become hyper-responsive, further exposure to the substance, sometimes even to tiny quantities, may cause respiratory symptoms. These symptoms can range in severity from a runny nose to asthma. Not all workers who are exposed to a sensitiser will become hyper-responsive and it is impossible to identify in advance who are likely to become hyper-responsive.
Substances than can cause occupational asthma should be distinguished from substances which may trigger the symptoms of asthma in people with pre-existing air-way hyper-responsiveness. The latter substances are not classified as asthmagens or respiratory sensitisers. Wherever it is reasonably practicable, exposure to substances that can cuase occupational asthma should be prevented. Where this is not possible the primary aim is to apply adequate standards of control to prevent workers from becoming hyper-responsive.
Activities giving rise to short-term peak concentrations should receive particular attention when risk management is being considered. Health surveillance is appropriate for all employees exposed or liable to be exposed to a substance which may cause occupational asthma and there should be appropriate consultation with an occupational health professional over the degree of risk and level of surveillance.
Chronic poisoning by natural pyrethrins may result in convulsion, tetanic paralysis, rapid and uneven heart beat, liver and kidney damage, or death.
The natural pyrethrins may produce hypersensitivity, especially following previous sensitising exposure. In general, repeated exposures over 2 or 3 years are required to elicit a response and involve exposure to pyrethrum rather than its individual components (including pyrethrins). The sesquiterpene lactone (pyrethrosin) and the pyrethrum glycoproteins account for the immediate and delayed hypersensitivity seen in guinea pigs following a single injection of ground chrysanthemum in Freud's adjuvant. Mild erythematic vesicular dermatitis (with papules), pruritus, localized oedema (particularly of the face, lips and eyelids), rhinitis, tachycardia, pallor and sweating are the most common syndromes. An initial skin sensitisation can progress to marked dermal oedema and skin cracking. Pyrethrum dermatitis appears to increase in hot weather or under conditions were heavy perspiration is produced. The active ingredients of pyrethrum (except pyrethrin II) are inactive in patch tests. Those patients allergic to ragweed pollen are particularly sensitive to pyrethrin.
Rats fed on a diet of pyrethrins for 5000 ppm for 2 years showed some signs of tissue damage including liver lesions, bile duct proliferation and focal necrosis of the liver cells. A no-effect level of 1000 ppm found in animal experiments correspond to a daily dose of 3600 mg/man.
The primary effect of long-term exposure to methylenedioxyphenol insect synergists such as the piperonyls (such as piperonyl butoxide - PBO) in animals is an increase in liver and thyroid weight, liver and kidney damage, and a decrease in body weight. These symptoms were observed in a diet of 52.8 mg/kg or more a day in a chronic study with dogs.
PBO is a possible human carcinogen. Currently there is no data from accidental exposure available regarding its carcinogenicity in humans; the only information is from animal studies. Several studies have shown that PBO treatment in rats causes an increase in liver cancer at high doses. The incidence of hepatocellular carcinoma, in male and female rats given 2.4% piperonyl butoxide was 80.0% and 57.7% respectively. Preneoplastic hepatic lesions such as nodular hyperplasia, cholangiofibrosis, and modular hyperplasia were also seen.
Some studies have shown that PBO treatment in rats corresponds with a very slight increase in thyroid cancer.
Rats fed diets containing from 0.6 to 2.4% piperonyl butoxide for approximately two years showed dose-related decreases in body weight. Roughened hair, lethargy, epistaxis, abdominal swelling, and decreased food consumption were observed at 2.4%. All dose rates induced skin tumours after about 1 year. Cumulative mortality varied from around 15 to 50%. Caecal haemorrhage was the cause of death. Dead rats with hepatic tumours were seen from week 74, but caecal haemorrhage or possible leukaemia was the cause of death. At necroscopy in rats surviving to the end of the study, hepatocellular adenomas and carcinomas occurred in both sexes in a dose-related manner. A dose-related increase in thrombocythemia was seen in male rats. The authors * of this study concluded that the primary feature of chronic piperonyl-butoxide toxicity is hepatocarcinogenicity. It is generally accepted that PBO does not demonstrate any significant potential for mutagenicity (genetic damage) but debate still exists.
PBO weakens the immune system by inhibiting lymphocyte response. Lymphocytes are a class of white blood cells that consume potentially dangerous pathogens and release antibodies. Inhibiting lymphocyte response weakens the body's ability to defend against foreign invaders.
Preventing the breakdown of toxic chemicals, may exacerbate potentially toxic effects.
PBO has been shown to adversely affect a variety of reproductive functions. Two-generational laboratory studies on rats show that litter weight and size are less for mothers exposed to high concentrations of PBO, and there is an increase in birth defects and fetal death. In one study the difference in the average weight of PBO-exposed offspring immediately after birth is negligible, but 7-14 days post-natal is significantly greater for those mothers that are exposed to PBO than for those that are not. The U.S. EPA maintains that results for teratogenicity (the ability to produce birth defects) in animals have been mixed, and while some studies suggest some teratogenicity, most do not. PBO may also interfere with sexual development because the enzymes it inhibits are responsible not only for the breakdown of toxic chemicals but also for the metabolism of other compounds such as steroids, which include the sex hormones. Rats exposed to PBO over the course of two years experience an atrophy of the testes a decrease in weight of the seminal vesicles (sperm producing structures), and an increase in ovarian weights. There is no evidence that PBO affects fertility.
Data has shown that PBO alone interferes with enzymes that maintain homeostasis of sodium and calcium in the brain and nervous system, possibly affecting neural response. Additionally, it increases the neurotoxicity of other compounds. Despite this data, EPA believes that these neurotoxic effects are slight and maintains that PBO poses

	no neurological risk. Behavioral changes have been noted with PBO as well. In a laboratory experiment, exposed rats experience more trouble navigating a maze than unexposed rats. The exposed rats travel longer distances and turned more frequently in the maze. PBO also induces changes in olfactory behavior of the offspring of exposed mothers. Offspring of exposed mothers are less likely to enter a compartment that smells like home than unexposed mothers. Exploratory behavior in mice increases as the dose of PBO they were treated with increased. This data shows that PBO has the ability to affect behaviors in mammals. Research on rats has found that PBO can cause intestinal ulcers and bleeding. Liver damage is common in studies,and kidney damage has been found as well. Long-term ingestion of PBO causes anemia, a decrease in the amount of hemoglobin (oxygen-transporting molecules) in blood, and increases the blood cholesterol level in rats. PBO can also damage the larynx, and there have been reports that it can cause labored breathing, an accumulation of fluid in the lungs, nasal bleeding, abdominal swelling, and loss of the ability to coordinate muscle movement. There has been a fair amount of investigation into the effects of dermal contact with PBO since it is used as a topical agent for lice, but there has been no evidence of it causing any local or systemic toxicity, and the amount of PBO absorbed from skin contact is characterized by some researchers as low. ChemicalWatch Fact Sheet Takahashi, O.,S. et al: Fundamental and Applied Toxicology: Vol 22., pp 293-303, Feb 1994

	Toxicity	**Irritation**
Permacol 16.2	Not available	Not available
Permethrin	LD50 (Dermal): 1750 mg/kg rat[2]	(Dermal) 500 mg/24h – light rabbit
	LD50 (Oral): 383 mg/kg rat[2]	
Piperonyl butoxide	LD50 (Dermal): >2000 mg/kg rat[1]	Not available
	LC50 (Inhalazion): >5.2 mg/l4 h rat[1]	
	LD50 (Oral): 2000 mg/kg rat[1]	
Tetramethrin	LD50 (Dermal): >5000 mg/kg rat[2]	(Eye) 100mg/1h – light rabbit
	LD50 (Oral): 4640 mg/kg.d rat[2]	
Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

11.2. Other hazzard informations.

Permethrin	The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis. [* The Pesticides Manual, Incorporating The Agrochemicals Handbook, 10th Edition, Editor Clive Tomlin, 1994, British Crop Protection Council] Oral (rat) LD50: 430-4000 mg/kg * Oral (mouse) LD50: 2960 mg/kg * cis/trans ratio: 40:60 cis/trans ratio: 20:80 ADI: 0.05 mg/kg for nominal cis-trans 40:60 and 25:75 isomers only
piperonyl butoxide	Dermal (rabbit) LD50: >1880 mg/kg [Handbook of Toxicology] *Published value - probably not peer-reviewed ADI: 0.03 mg/kg
Tetramethrin	The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. Bacterial mutagen ADI: 0.02 mg/kg/day NOEL: 2 mg/kg/day
Permacol 16.2 e Permethrin	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.
permethrin & piperonyl butoxide	The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.

Acute Toxicity	No	Carcinogenicity	Yes
Skin Irritation/Corrosion	No	Reproductivity	No
Serious Eye Damage/Irritation	No	STOT - Single Exposure	No
Respiratory or Skin sensitisation	Yes	STOT - Repeated Exposure	No
Mutagenicity	No	Aspiration Hazard	No

Legend: No – Data either not available or does not fill the criteria for classification

Si – Data available to make classification

11.2.1. Endocrine Disruption Properties

Informations not available

SECTION 12. Ecological information.

12.1. Toxicity.

	Endpoint	Test Duration (hr)	Species	Value	Source
Permacol 16.2	Not Available	Not Available	Not Available	Not Available	Not Available
Permethrin	NOEC (ECx)	504h	Crustacea	<0.001 mg/L	4
	LC50	96h	Fish	<0.001 mg/L	4
	EC50	48h	Crustacea	<0.001 mg/L	4
piperonyl butoxide	NOEC (ECx)	48h	Crustacea	0.01 mg/L	4
	EC50	72h	Algae or other aquatic plants	0.85 mg/L	2
	LC50	96h	Fish	1-3.3 mg/L	4
	EC50	48h	Crustacea	0.46-0.674 mg/L	4
Tetramethrin	EC50(ECx)	48h	Crustacea	0.046-0.058 mg/L	4
	LC50	96h	Fish	0.003-0.007 mg/L	4
	EC50	48h	Crustacea	0.046-0.058 mg/L	4
Legend:	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
For synthetic pyrethroids:

Environmental fate:
Synthetic pyrethroids are examples of optimised insecticidal activity, selectivity and tailored environmental persistence. Through modifications of both acid and alcohol portions of the ester, compounds of desired residual activity have been synthesised whilst maintaining a biodegradable ester linkage. These compounds are generally very toxic to crustaceans and fish in laboratory bio assays. Under field conditions, however, the residues are tightly bound in sediment, and ingested residues are readily metabolised. Their toxicity in natural systems are generally less than laboratory test data might indicate. They are generally non-persistent in the environment.
In pond waters and in laboratory degradation studies, pyrethroid concentrations decrease rapidly due to sorption to sediment, suspended particles and plants.
Pyrethrins are generally unstable in the presence of light, are hydrolysed rapidly under alkaline conditions and oxidise rapidly in air. Vapour phase pyrethrins may combine chemically with ozone to produce hydroxy radicals. Pyrethroids where the isobutenyl group attached to the cyclopropane moiety has been altered are more stable to sunlight than the early pyrethroids like allethrin or resmethrin. For this reason, pyrethroids such as permethrin, deltamethrin, cyhalothrin, cyfluthrin, and cypermethrin are more frequently applied outdoors to crops in comparison to the rapidly degraded pyrethroids like resmethrin and allethrin.
Because agricultural dose rates are low and biological degradation is generally rapid, residues are unlikely to attain significant levels. Permethrin disappears from ponds and streams within 6-24 hours, pond sediments within 7 days and foliage and forest soil within 58 days. Since pyrethrins and pyrethroids undergo photolysis in the atmosphere, they are also degraded by this mechanism in sunlit surface waters. Photosensitising agents found in natural waters such as fulvic and humic acids increase the rate of photolysis. Pyrethroids and pyrethrins also undergo hydrolysis in the environment at varying rates depending upon pH and temperature. Generally, hydrolysis is only an important environmental fate process under alkaline conditions and at temperatures of 20 deg. C or greater.
Based on the vapor pressure of the pyrethrins and pyrethroids, these compounds are expected to exist in both vapor and particulate phases in the ambient atmosphere. Vapor phase pyrethrins and pyrethroids are rapidly degraded in the atmosphere by direct photolysis and reaction with oxidants found in air such as photochemically-produced hydroxyl radicals, ozone, and nitrate radicals. Particulate phase compounds are slower to degrade, however, and can travel long distances before being removed from the air by wet and dry deposition. Pyrethrins and pyrethroids are strongly adsorbed to soil surfaces and are not considered very mobile. A wide range of Koc values has been reported by different authors, but most of these values indicate a high degree of adsorption and little leaching potential. Since light is attenuated as a function of depth from the soil surface, photolysis of pyrethrins and pyrethroids is only an important environmental fate process at the surface of the soil. The potential for significant toxicity is not reached in fields. Under aerobic conditions in soil, permethrin degrades in a relatively short time (half-life 28 days).
Volatilisation from water and soil is expected to occur slowly for many of the pyrethroids since these compounds generally have low vapor pressures and Henry's law constants. When released to water, partitioning to suspended solids and sediment occurs rapidly. These compounds adsorb strongly to suspended solids and sediment in the water column, and this process significantly attenuates volatilisation. Volatilisation losses from foliage may be

considerably greater than volatilisation from soils because pyrethrins and pyrethroids do not adsorb as strongly to the leafy component of vegetation as to soils. Pyrethrins and pyrethroids are often used indoors in sprays or aerosol bombs, and the volatilisation rates from glass or floor surfaces may be significantly faster than from soils since these compounds are not likely to adsorb as strongly to these surfaces.
Little data exist regarding the uptake and transport of pyrethrins and pyrethroids by plant material. Since many of these compounds are rapidly degraded in the environment, this transport mechanism may not be an important environmental fate process other than the initial settling of these compounds on the canopy following deposition. The aerial surface of a plant, including foliage, is covered by a cuticle, which serves as a barrier to water loss and to prevent penetration of applied chemicals or environmental pollutants. Once deposited on the surface, a chemical may be degraded, bind to the cuticle, or diffuse into the plant through the stomata. Since pyrethrins and pyrethroids adsorb strongly to soils, their uptake from roots and transport within plants is expected to be limited.
The general population is exposed to pyrethrins and pyrethroids primarily from food sources, especially fruits and vegetables. The tendency of young children to ingest soil, either intentionally through PICA or unintentionally through hand-to-mouth activity, is well documented. These behavioral traits can result in ingestion of pyrethrins and pyrethroids present in soil and dust. Since these compounds are adsorbed strongly to soils, they may not be in a highly bioavailable form. Young children often play on the ground or on carpets and this will increase the likelihood of dermal exposure and inhalation of contaminated particles from soil, household dust and treated surfaces. Drinking Water Standards:
pesticide 0.1 ug/l (UK max.)

Ecotoxicity:
Synthetic pyrethroids are extremely effective against insects, but are relatively safe to mammals and birds. One potential problem of pyrethroids is their extreme toxicity to aquatic organisms, where often <1 ug/L will produce toxic effects.
The half-lives for elimination of several pyrethroids by trout are all greater than 48 hours, while elimination half-lives in birds and mammals range from 6 to 12 hours Pyrethroids are highly toxic to fish; with 96-hour LC50 values generally below 10 ug/l. Corresponding LD50 values in mammals and birds are in the range of several hundred to several thousand mg/kg. Fish sensitivity to the pyrethroids may be explained by their relatively slow metabolism and elimination of these compounds. The half-lives for elimination of several pyrethroids by trout are all greater than 48 hours, while elimination half-lives for birds and mammals range from 6 to 12 hours Generally, the lethality of pyrethroids to fish increases with increasing octanol/water partition coefficients The bioaccumulation factor of cypermethrin in fish is approximately 1000 when measured experimentally.
Substances containing unsaturated carbons are ubiquitous in indoor environments. They result from many sources. Most are reactive with environmental ozone and many produce stable products which are thought to adversely affect human health. The potential for surfaces in an enclosed space to facilitate reactions should be considered.

DO NOT discharge into sewer or waterways.

12.2. Persistence and degradability.

Ingredient	Persistence: Water/Soil	Persistence: Air
PERMETHRIN	HIGH	HIGH
PIPERONYL BUTOXIDE	HIGH	HIGH
TETRAMETHRINE	HIGH	HIGH

12.3. Bioaccumulative potential.

Ingredient	Bioaccumulation
PERMETHRIN	LOW (LogKOW = 7.4267)
PIPERONYL BUTOXIDE	HIGH (LogKOW = 4.75)
TETRAMETHRINE	MEDIUM (LogKOW = 4.3671)

12.4. Mobility in soil.

Ingredient	Mobility
PERMETHRIN	LOW (KOC = 178400)
PIPERONYL BUTOXIDE	LOW (KOC = 69.74) 6-
TETRAMETHRINE	LOW (KOC = 3533)

12.5. Results of PBT and vPvB assessment.

The substances present do not meet the PBT or vPvB criteria.

12.6. Endocrine Disruption Properties

Information not available.

12.6. Other adverse effects

Information not available.

SECTION 13. Disposal considerations.

13.1. Waste treatment methods.

Product / Packaging disposal	Containers may still present a chemical hazard/ danger when empty. Return to supplier for reuse/ recycling if possible. Otherwise: If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. Where possible retain label warnings and SDS and observe all notices pertaining to the product. Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: - Reduction - Reuse - Recycling Product / Packaging disposal - Disposal (if all else fails) This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. DO NOT allow wash water from cleaning or process equipment to enter drains. It may be necessary to collect all wash water for treatment before disposal. In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. Where in doubt contact the responsible authority. Recycle wherever possible or consult manufacturer for recycling options. Consult State Land Waste Authority for disposal. Bury or incinerate residue at an approved site. Recycle containers if possible, or dispose of in an authorised landfill.
Waste treatment options	Not Available
Sewage disposal options	Not Available

SECTION 14. Transport information.

14.1. UN number.

ADR / RID, IMDG, IATA: 3082

14.2. UN proper shipping name

ADR / RID, ADN:	Environmentally hazardous substance, liquid, n.o.s. (contains permethrin, piperonyl butoxide and tetramethrin)
IMDG :	Environmentally hazardous substance, liquid, n.o.s. (contains permethrin, piperonyl butoxide and tetramethrin))
IATA:	Environmentally hazardous substance, liquid, n.o.s. (contains permethrin, piperonyl butoxide and tetramethrin)

14.3. Transport hazard class(es)

ADR / RID:	Class: 9	Label: 9
IMDG:	Class: 9	Label: 9

IATA: Class: 9 Label: 9

14.4. Packing group.

ADR / RID, IMDG, IATA: III

14.5. Environmental hazard.

ADR / RID: Environmentally hazardous.

IMDG: Marine Pollutant

IATA: Environmentally hazardous.

14.6. Special precautions for user.

ADR / RID:	HIN - Kemler: 90	Limited quantity: 5 L	Tunnel Restriction Code: 3 (-)
	Special provisions: 274, 335, 375, 601	Classification code: M6	Hazard Label: 9
IMDG:	EMS: F-A, S-F	Limited quantity: 5 L	Special provisions: 274, 335, 969
IATA:	Cargo:	Maximum Qty: 450 L	Packing Instructions: 964
	Pass.:	Maximum Qty: 450 L	Packing Instructions: 964
	Special provisions: A97, A158, A197, A215	Passenger and Cargo Limited Maximum Qty / Pack: 30 kg G	
ADN:	Classification code: M6	Limited quantity: 5 L	Special provisions: 274, 335, 375, 601
	Equipment required: PP	Fire cones number: 0	

14.7. Transport in bulk according to Annex II of MARPOL and the IBC code.

Not Applicable

SECTION 15. Regulatory information.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.

PERMETHRIN if found in the following lists of regulations	Europe EC Inventory; European Union - European Inventory of Existing Commercial Chemical Substances (EINECS); European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI; International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs.
PIPERONYL BUTOXIDE if found in the following lists of regulations	EU European Chemicals Agency (ECHA) Community Rolling Action Plan (CoRAP) List of Substances; Europe EC Inventory; European Union - European Inventory of Existing Commercial Chemical Substances (EINECS); International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs.
TETRAMETHRINE if found in the following lists of regulations	Europe EC Inventory; European Union - European Inventory of Existing Commercial Chemical Substances (EINECS); European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI.

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable - : Directives 98/24/EC, - 92/85/EEC, - 94/33/EC, - 2008/98/EC, - 2010/75/EU; Commission Regulation (EU) 2020/878; Regulation (EC) No 1272/2008 as updated through ATPs.

15.2. Chemical safety assessment.

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

.

National Inventory	Status
Australia - AIIC / Australia non-industriale Usa	Yes
Canada – DSL	No (Permetrina; Tetrametrina)
Canada – NDSL	No(Permetrina; Piperonil butossido, tetrametrina)
China – IECSC	Yes
Europe – EINEC/ELINCS/NLP	Yes
Japan – ENCS	Yes
Korea – KECI	Yes
New Zealand – NZLoC	Yes
Philippines – PICCS	Yes
USA – TSCA	No (Permetrina; Tetrametrina)
Taiwan – TSCI	Yes
Mexico – INSQ	Yes
Vietnam – NCI	Yes
Russia – FBEPH	Yes
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16. Other information.

MINISTRY OF HEALTH AUTHORIZATION N. 19856

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H332	Harmful if inhaled.
H371	May cause damage to organs.
H400	Very toxic to aquatic life.

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.
For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:
EN 166 Personal eye-protection
EN 340 Protective clothing
EN 374 Protective gloves against chemicals and micro-organisms
EN 13832 Footwear protecting against chemicals
EN 133 Respiratory protective devices

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
ES: Exposure Standard
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection

OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index
AIIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

Powered by AuthorITe, from Chemwatch.